

Kepler's Multiple Planet Systems

Among the 1800 Kepler targets that have candidate planets, 20% have two or more candidate planets. While most of these objects have not yet been confirmed as true planets, several considerations strongly suggest that the vast majority of these multi-candidate systems are true planetary systems. Virtually all candidate systems are stable, as tested by numerical integrations (assuming a nominal mass-radius relationship). Statistical studies performed on these candidates reveal a great deal about the architecture of planetary systems, including the typical spacing of orbits and flatness of planetary systems.

The distribution of observed period ratios shows that the vast majority of candidate pairs are neither in nor near low-order mean motion resonances. Nonetheless, there are small but statistically significant excesses of candidate pairs both in resonance and spaced slightly too far apart to be in resonance, particularly near the 2:1 resonance. The characteristics of the confirmed Kepler multi-planet systems will also be discussed.